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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,914	08/17/2006	Martin Dinant Bijker	008895-0355438	4847
909 7590 10/28/2010 PILLSBURY WINTHROP SHAW PITTMAN, LLP P.O. BOX 10500 MCLEAN, VA 22102				
EXAMINER				
LEE, JAE				
ART UNIT		PAPER NUMBER		
2895				
NOTIFICATION DATE		DELIVERY MODE		
10/28/2010		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/583,914

Applicant(s)

BIJKER ET AL.

Examiner

JAE LEE

Art Unit

2895

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 August 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-25 and 27-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,9-22,28-34,36,37 is/are rejected.
- 7) ☒ Claim(s) 6-8,23-25,27,35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1, 2, 4, 5, 9-22, and 28-34 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

2. Claim 27 is objected to because of the following informalities:
 - a. "sputtering electrode" lacks antecedent basis.
3. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akahori (Pub No. US 2003/0129851 A1, hereinafter Akahori) and further in view of Chistyakov.

With regards to claim 1. Akahori teaches a method for manufacturing a functional layer, comprising:

introducing a substrate into a process chamber (see Fig. 1, wafer W);

generating a plasma (see ¶125, plasma deposition system used);

depositing a first deposition material on the substrate under the influence of the plasma, wherein, at the same time, applying a second deposition material to the substrate with a second deposition process (see Fig. 1, first and second deposition materials from 62A-62B are deposited onto W),

wherein the functional layer has no catalytic function and forms a coating selected from the group consisting of anti-reflective, heat-resistant, and optical coatings (see Fig. 1, coating on W will be anti-reflective), and

wherein a volatile compound of the first deposition material is supplied from outside the process chamber to the plasma for the deposition (see Fig. 1, volatile compound from any of 62A-62D are outside of process chamber).

Akahori, however, does not teach utilizing a DC plasma source.

In the same field of endeavor, Chistyakov teaches the use of a DC plasma source since it can be advantageous of reducing probability of establishing electrical breakdown condition leading to an undesirable electrical discharge (see col. 3, lines 57-67).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to incorporate a DC plasma source since it can be advantageous of reducing probability of establishing electrical breakdown condition leading to an undesirable electrical discharge

With regards to claim 2, Akahori teaches a method according to claim 1, wherein the first deposition material is supplied to the plasma outside the plasma source in the process chamber (see Fig. 1, 62A-62D supplied from outside the plasma source).

With regards to claim 5, Akahori teaches a method according to claim 1, wherein the second deposition process is parallel-plate PECVD (see ¶29).

With regards to claim 9, Akahori teaches a method according to claim 1, wherein the substrate comprises sheet material (see Fig. 1, W is a sheet material).

With regards to claim 11, Akahori teaches a method according to claim 1, wherein the substrate is brought from an environment into the process chamber and is discharged from the process chamber to the environment while the deposition material is deposited on the substrate in the process chamber (see Fig. 1, disk taken out of the chamber after layers are applied).

With regards to claims 12-16, Akahori nor Chistyakov teaches that the substrate is substantially non-porous and comprises a metal or plastic, the substrate comprises a carrier material, the substrate comprises a metal and/or alloy, the substrate comprises corrugated material, and the substrate is substantially porous.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to merely select known materials to comprise the wafer. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination (see *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 US 327, 65 USPQ 297 (1945)).

It would have also been obvious to also modify different shapes or designs of the wafer. A configuration of the wafer (i.e. porosity v. non-porosity, corrugation) was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the wafer was significant.

With regards to claim 17, Akahori and Chistyakov do not teach a method according to claim 1, wherein the first and/or second deposition material is deposited such that the chemical composition of the deposited material measured over distances of 5 cm.

It would have been obvious to one of ordinary skill to determine the optimum distance (see *In re Aller, Lacey, and Hall* (10 USPQ 233-237)). It is not inventive to discover optimum or workable ranges by routine experimentation. Note that the specification contains no disclosure of either the critical nature of the claimed ranges or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical (see *In re Woodruff*, 919 f.2d 1575, 1578, 16 USPQ 2d 1934, 1936 (Fed. Cir. 1990)).

With regards to claim 18, Chistyakov teaches a method according to claim 1, wherein the substrate is adjusted to a particular electrical potential by DC, pulsed DC and/or RF biasing (see col. 3, line 57).

With regards to claim 19, Akahori teaches a method according to claim 1, wherein the substrate is adjusted to a treatment temperature (there is a temperature when performing the process).

With regards to claim 20, Akahori teaches an apparatus for manufacturing a functional layer on a substrate, comprising:

- a process chamber (see Fig. 1, process chamber);

- a first deposition material source configured to introduce a first deposition material into the plasma (see Fig. 1, first deposition from 62A-62D);

- a substrate positioning device configured to bring and/or keep at least a part of a substrate in such a position in the process chamber that the substrate contacts said plasma (see Fig. 1, substrate positioning device present);

- a second deposition material source configured to deposit a second deposition material on the substrate at the same time as the plasma source, wherein the functional layer has no catalytic function and forms a coating selected from the group consisting of anti-reflective, heat-resistant, and optical coatings (see Fig. 1, second deposition material from 62A-62D with plasma source present producing a anti-reflective coating such as SiOF).

A fluid supply channel configured to supply the first deposition material to be deposited, in a volatile state, from outside the process chamber to the plasma (fluid could also mean gaseous state, present outside the chamber)

Akahori, however, does not teach utilizing a DC plasma source.

In the same field of endeavor, Chistyakov teaches the use of a DC plasma source since it can be advantageous of reducing probability of establishing electrical breakdown condition leading to an undesirable electrical discharge (see col. 3, lines 57-67).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to incorporate a DC plasma source since it can be advantageous of reducing probability of establishing electrical breakdown condition leading to an undesirable electrical discharge

With regards to claim 21, Akahori teaches an apparatus according to claim 20, wherein the second deposition material source is a VD source, including a CVD source, a PVD source, or a PECVD source (see ¶25, PECVD performed).

With regards to claim 22, Akahori teaches an apparatus according to claim 20, wherein the second deposition material source is configured to carryout deposition processes including: PECVD, CVD, PVD, sputtering, hollow-cathode sputtering, vapor deposition using boats, e-beam, and/or supported by an ion process, ion plating, microwave deposition, ICP (inductive coupled plasma), parallel-plate PECVD, and/or honeycomb electrode structures (see ¶25, parallel plate PECVD).

With regards to claim 30, Akahori teaches an apparatus according to claim 20, wherein a wall of the process chamber is provided with a passage to pass the substrate into and/or out of the process chamber (if substrate is in the process chamber, there must have been a passage that the substrate went through to reach its destination).

With regards to claim 34, Akahori teaches an apparatus according to claim 20, wherein the first and/or second deposition material is vapor deposited on the substrate (see ¶25, parallel plate vapor deposition).

1. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akahori and Chistyakov as applied to claim 1 above, and further in view of Sakai et al. (Pub No. US 2002/0016017 A1, hereinafter Sakai).

With regards to claim 10, Akahori and Chistyakov teach the limitations of claim 1 for the reasons above.

Akahori and Chistyakov, however, do not teach the substrate moving so that different parts of substrate contacts the plasma.

In the same field of endeavor, Sakai teaches how moving a substrate in a plasma CVD process is advantageous since this will form a film which is continuously and uniformly formed on the substrate (see ¶19).

2. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akahori and Chistyakov as applied to claim 20 above, and further in view of Vijayen.

Akahori and Chistyakov do not teach an apparatus according to claim 20, further comprising

two DC plasma cascade sources configured to generate two plasmas, wherein the two DC plasma cascade sources and the substrate positioning device are positioned such that, during use, opposite sides of the substrate contact the

plasmas generated by the two DC plasma cascade sources to deposit material on the opposite sides of the substrate

In the same field of endeavor, Vijayen et al. teaches how two plasma beam sources can be used to coat opposite sides of the substrate simultaneously (see ¶67).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to incorporate a plasma deposition system where both sides of the substrate are coated using two plasma sources (Chistyakov teaches DC plasma). This would allow uniform and complete covering of the coating on the wafer for semiconductor processes.

3. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akahori and Chistyakov as applied to claim 20 above, and further in view of Williams et al. (USP# 5,468,520, hereinafter Williams et al.).

With regards to claim 29, Akahori and Chistyakov teach limitations of claim 20 for the reasons above.

Akahori and Chistyakov, however, does not teach an apparatus according to claim 20, further comprising a substrate supply roller and discharge roller, respectively, configured to supply and discharge, respectively, a substrate that can be rolled up to and from the process chamber, respectively.

In the same field of endeavor, Williams et al. teaches a roller system whereby a substrate can enter and leave the process chamber (see Fig. 3, substrate on rollers will enter and leave the process plasma chamber).

4. Claims 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akahori and Chistyakov as applied to claim 20 above, and further in view of Guerra (Pub No. US 2003/0228727 A1, hereinafter Guerra).

With regards to claim 31, Akahori and Chistyakov teach limitations of claim 30 for reasons above.

Akahori and Chistyakov, however, does not teach an apparatus according to claim 30, wherein at least apart of the passage the process chamber wall is bounded by oppositely arranged feed-through rollers configured to engage a part of the substrate disposed between them during use, for feed-through of the substrate

In the same field of endeavor, Guerra teaches rollers which engage on the substrate to deform the substrate thus causing corrugation shaped substrates with a sputtering chamber (see Fig. 6, ¶131).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made since the position of the rollers whether it be inside or outside would not have modified the operation of the device. One of ordinary skill in the art would have recognized that the rollers could also be incorporated within the chamber (see *In re Japiske*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950)).

With regards to claim 32, Guerra teaches an apparatus according to claim 29, further comprising a deformation means member configured to deform the substrate which has unrolled from the supply roller (see Fig. 6, deformation means 53).

With regards to claim 33, Guerra teaches an apparatus according to claim 32, wherein the deformation member is configured to corrugate and/or serrate the substrate (see Fig. 6, substrate corrugated).

5. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akahori and Chistyakov as applied to claim 1 above, and further in view of Ichihara.

With regards to claim 36, Akahori and Chistyakov do not teach the first deposition materials to be ZnS and the second deposition materials to be SiO₂.

In the same field of endeavor, Ichihara teaches that such materials can be used for manufacturing processes for deposition (see ¶130).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to select the materials for use in depositions since these are well known materials and well within the ordinary capabilities of one skilled in the art to select these materials as a choice for deposition.

6. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akahori and Chistyakov as applied to claim 1 above, and further in view of Shibata.

With regards to claim 37, Akahori and Chistyakov teach the limitations of claim 1 for the reasons above.

Akahori and Chistyakov, however, does not teach a method according to claim 1, wherein the first deposition material is MgF₂ and the second deposition material is TiO₂.

In the same field of endeavor, Shibata teaches how MgF_2 and TiO_2 may be deposited using a plasma method (see ¶64).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to utilize plasma processes to deposit MgF_2 and TiO_2 since this has been made well-known and demonstrated by Shibata that a plasma process can deposit such materials. Furthermore, such selection of well-known materials do not hold patentable weight unless criticality of the selection of materials are clearly disclosed within the specification (see *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960)).

Allowable Subject Matter

7. Claims 6-8, 23-25, 27, and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAE LEE whose telephone number is (571)270-1224. The examiner can normally be reached on Monday - Friday, 7:30 a.m. - 5:00 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Richards can be reached on 571-272-1736. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jae Lee/
Examiner, Art Unit 2895

JML

/N. Drew Richards/
Supervisory Patent Examiner, Art Unit 2895